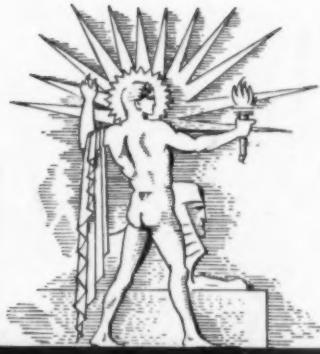


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# SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE.



April 30, 1938

**Handsome**

See Page 279

A SCIENCE SERVICE PUBLICATION

# Do You Know?

So-called "cheese wool" is fiber made from casein.

Italian fishermen are using over half a million glass bulbs a year as substitutes for the old fashioned cork floaters.

Inscriptions found in Mesopotamia show that enterprising business men of 3000 B. C. formed holding companies, even as in our own age.

A Yellowstone Park naturalist, who tried to take a picture of a hibernating bear, had to retreat quickly when the supposedly sleeping bear came at him.

Dairy interests kept track of ice cream consumed by Olympic athletes on several trips, and report that the athletes ate far more ice cream than ordinary citizens.

Books bound in sheepskin may regain their old popularity, now that scientists have found that different methods of tanning can improve the lasting quality of this leather.

The first shipment of helium sold by the Government to a private firm cost less than \$60, though prior to 1917 this amount of helium would have been valued at six million dollars.

How to build an automobile driveway that will not have too steep an incline, and that is otherwise designed for safety and convenience is told in a new Department of Agriculture circular.

## SCIENCE NEWS LETTER

Vol. 33 APRIL 30, 1938 No. 18

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 2101 Constitution Avenue, Washington, D. C., Edited by WATSON DAVIS.

Subscriptions—\$5.00 a year; two years \$7.00; 15 cents a copy. Ten or more copies to same address, 5 cents a copy. Back numbers more than six months old, 25 cents.

Members of the American Association for the Advancement of Science have privilege of subscribing to SCIENCE NEWS LETTER at the reduced price of \$3 per year. Applications for this privilege should be accompanied by privilege card obtained from the Permanent Secretary, A.A.A.S., Smithsonian Institution Building, Washington, D. C.

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## QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.

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What would give a baby chick ability to crow? p. 285.

### POPULATION

How does America's minority peoples problem differ from that of Europe? p. 288.

### PUBLIC HEALTH

Is undulant fever prevalent in the United States? p. 284.

A medical examination before marriage is compulsory in Turkey.

Corn weevils can be killed cheaply by carbon monoxide gas, by running exhaust gas from an automobile in a sealed crib.

It is estimated that there is enough peat fuel of good quality in Minnesota to last until the year 15,255, if burned steadily a ton per minute.

A nail is less apt to crack plaster if the nail is heated before driving it.

It is estimated that Indians of Peru had produced about \$112,900,000 worth of gold up to the time of the Spanish Conquest.

Luminous stucco that glitters in the sun is being used on some buildings for the Golden Gate International Exposition in San Francisco.

zines and other publications are invited to avail themselves of the numerous syndicate services issued by Science Service.

Cable address: Scienserv, Washington.

Entered as second class matter at the post-office at Washington, D. C., under the act of March 3, 1879. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature and in the Engineering Index.

Advertising rates on application. Member Audit Bureau of Circulation.

SCIENCE SERVICE is the Institution for the Popularization of Science organized 1921 as a non-profit corporation, with trustees nominated by the National Academy of Sciences, the National Research Council, the American Association for the Advancement of Science, the E. W. Scripps Estate and the journalistic profession.

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## PHYSICS

# Cosmic Rays May Originate In Destruction of Elements

**Evidence Presented by Dr. Millikan to National Academy Indicates Sun's Magnetism Extends in Space**

**N**EW evidence for the creation of powerful cosmic rays through the annihilation of the universe's commonest chemical elements, sparsely scattered in the far reaches of space, was presented to the National Academy of Sciences by Dr. Robert A. Millikan, Nobel prize-man, of the California Institute of Technology.

The first evidence obtained by science that the sun's magnetic field extends out into space, enveloping the earth and the whole solar system, has also resulted from Dr. Millikan's latest cosmic ray researches.

Dr. Millikan, with his colleagues, Drs. I. S. Bowen and H. Victor Neher, probed the earth's atmosphere with balloons practically to its top. They found that the way in which the energy in incoming, highly penetrating cosmic rays is distributed gives evidence for the annihilation theory of cosmic ray production.

The most abundant elements that are destroyed in creating cosmic rays are carbon, nitrogen, and oxygen, together with relatively high percentages of sodium, silicon, and aluminum. These are among the commonest elements in the universe. The elements that give rise to cosmic rays range in atomic weight between 6 and 28.

## GENERAL SCIENCE

# Wild Beasts Have Arthritis But Rats and Bats Are Immune

**America's Oldest Scientific Society Hears Also Of Successful Use of Lindbergh's "Glass Heart"**

**G**RANDPA Gorilla has his bad days with "rheumatiz", no less than his human nth-degree cousins. Hyenas have it, too—presumably they don't laugh then. It seems to be the same kind of rheumatism—arthritis—most common and most painful in human beings.

Occurrence of arthritis in wild animals was described by Prof. Herbert Fox of the University of Pennsylvania, who addressed the meeting of the American Philosophical Society in Philadelphia. The Society is the oldest of American scientific bodies; it was founded by

Benjamin Franklin in 1727.

Prof. Fox, as pathologist to the Philadelphia Zoological Society, has had ample opportunity to diagnose the disease in many living animals. He has also examined skeletons in several museums. The total number of animals examined was 1,749, of which 77 proved to be definitely arthritic.

Occurrence of the malady among animals appears to be as little governed by rules as it is among us suffering humans. It is not correlated with climate, location, food, focal infections, or kind of animal. It was most easily detected as an affliction of the spine, but was also found in other parts of the skeleton.

Animal families (*Turn to Page 287*)

## ORNITHOLOGY

## Audubon 100th Anniversary Marked by Exhibit of Art

See Front Cover

**M**ARKING the hundredth anniversary of America's greatest early work on natural history, John James Audubon's *Birds of America*, a national exhibition of the works of the famous artist-naturalist will be held at the Academy of Natural Sciences of Philadelphia from April 26 to June 1.

In 1838 Audubon published the completing section of his marvelous series of colored plates showing the principal spe-



HOW HE LOOKED

*This portrait of Audubon by his son, John Wodehouse Audubon, shows the great artist-naturalist as he appeared when in the field. Tradition has it that the elder Audubon painted the dog himself.*

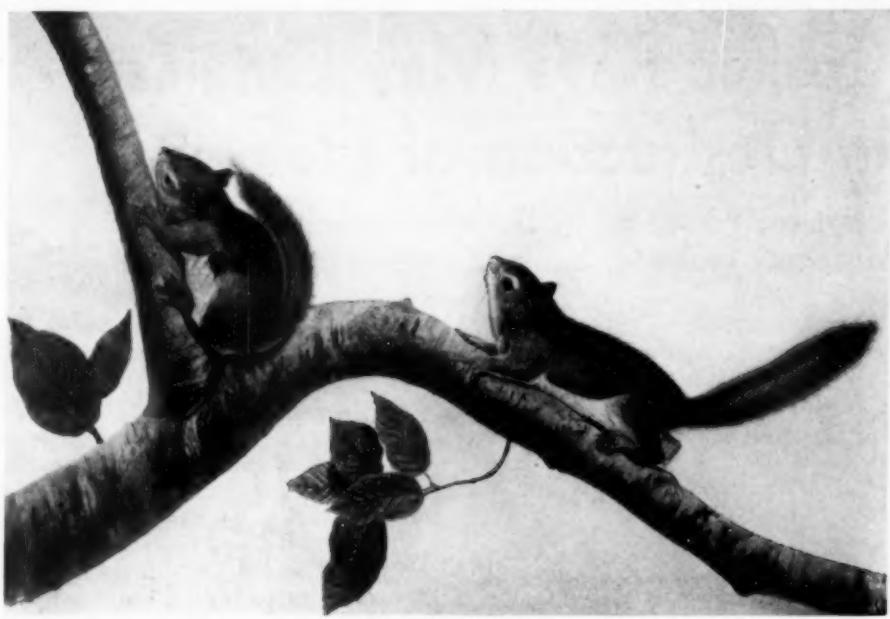
cies of American birds in vivid natural hues. These pictures were the best bird representations in existence then and for a long time afterward.

Audubon not only brought high artistic ability to his work; for the first time he showed birds as they are in the wild, and not in the stiff, "stuffed" style, then prevalent in natural history paintings. Audubon even dramatized his bird poses a little; it has been remarked, "All his birds are Frenchmen."

Audubon was born in the French colony of Santo Domingo in 1785. At four, he was taken to France for his education and remained there until he was eighteen, when he came to America. His headquarters were at Philadelphia, then the largest city in the United States and its chief scientific center.

He tried several ventures, but the call of his art and the lure of the wilderness were too strong. He wandered all over what was then the wild interior of the country, from Kentucky to Texas, observing, taking notes, painting, collecting specimens.

Among his bird portraits is a picture of one of the handsomest of all American bird species, the ivory-billed woodpecker, now almost extinct. It is shown on the cover of this week's SCIENCE NEWS LETTER. Audubon saw



#### LESS WELL KNOWN

*Audubon's popular fame rests primarily on his studies of birds, but he did not neglect other animals. Pictures of mammalian life, as vivid and vigorous as this sketch of two squirrels of the Rocky Mountain region, illustrate a book, "Viviparous Quadrupeds."*

and painted this pair in Kentucky in 1812. The original painting is now the property of the Library of Harvard College.

*Science News Letter, April 30, 1938*

#### CHEMISTRY

## Improve Sulfanilamide for More Potency, Less Toxicity

**Use of New Compound To Protect Mice From Influenza Offers Hope of Eventual New Usefulness for Man**

ONQUEST of influenza may be the next victory that will be chalked up to the credit of sulfanilamide, widely used chemical remedy that is already famous for speeding recoveries from blood poisoning (septicemia), gonorrhea, gangrene, peritonitis, septic sore throat, and other infectious ills. This appeared from the report of Dr. M. L. Crossley, research director of the Calco Chemical Company, to the American Chemical Society, meeting in Dallas.

Advising caution against translating, immediately, findings with animals into human benefits, Dr. Crossley nevertheless reported that a newly-prepared chemical relative of sulfanilamide showed

"marked protective action against experimental influenza in mice."

"Should this compound," he declared, "prove effective for human use against influenza, it would mean that mankind at least has a weapon against a scourge such as the world-wide epidemic of influenza which occurred in 1918."

The new compound is 2,5-bis sulfanilamido-benzene sulfonic acid. It is considered the most promising of a number of new sulfanilamide compounds described by Dr. Crossley because it appears to give 100 per cent. protection against streptococcus infections in mice as well as showing protective action against influenza in mice.

"While sulfanilamide has been demonstrated to be a very valuable drug in medicine, it is far from being all-sufficient and the aim of investigators in both chemical and medical research is to find new compounds which will be more effective and less toxic than sulfanilamide," said Dr. Crossley, in presenting his report with Drs. E. H. Northey and M. E. Hultquist.

Dr. Crossley described new types of drugs of the sulfanilamide family which, in tests on experimental mice, have only one-tenth the toxicity of regular sulfanilamide and from 5 to 6 times the potency. Ten times the amount of these drugs may be used with only the same toxic effect, and the amount administered is many times as potent in killing infectious disease organisms. Sulfanilamide has been used, with often dramatic results, in treating gonorrhea, septicemias (blood poisonings), gangrene, peritonitis, mastoiditis and pneumonia, said Dr. Crossley.

The new improvements in sulfanilamide drugs consist of linking two or more sulfanilamide molecules into larger molecules. Several of the drugs described by Dr. Crossley consist of two sulfanilamide molecules linked together into a dumbbell-shaped larger molecule. One can think of these new drugs, Dr. Crossley indicated, as being derived from the parent sulfanilamide and—like human

children—possessing attributes of the parent but having, in addition, some new, acquired characteristics.

While sulfanilamide has been effective in treating bacterial infections, said Dr. Crossley, some of the newer drugs, derived chemically from it, appear also to have usefulness in combatting the baffling virus diseases.

#### Hormone From Pituitary

For making the first isolation of a crystalline hormone from the anterior pituitary gland Dr. Abraham White of Yale University received the \$1,000 Eli Lilly and Company Award in biological chemistry and Dr. White announced to fellow chemists the researches leading to this chemical feat.

The pituitary gland is the tiny body hanging from the base of the brain which leads the body's team of glands. The hormone Dr. White has isolated in pure crystalline form is the one which stimulates milk secretion.

Hope of discovering the chemical formula of this and a number of other hormones and of then creating them by chemical synthesis is very slim, Dr. White pointed out. The reason is that this and other pituitary gland hormones as well as insulin, the diabetic remedy, and the hormones of thyroid and parathyroid glands are protein in nature.

Proteins are extremely complex. Dr. White recalled that Emil Fischer, the great protein chemist, once calculated that the number of possible structural arrangements of a single protein might be as many as 10 to the 27th power. The chances of finding the correct arrangement out of so many possibilities seem remote.

#### Flame-Proofing Chemicals

Low-cost fire protection for America's homes should soon be more widely available through advances in chemical engineering revealed at the meeting.

Chemistry, by a new process, is now able to make cheaply and in vast quantities an acid from which can be made a unique flameproofing chemical. The chemical, known as ammonium sulfamate, does not change the appearance or feel of fabrics or paper impregnated with it. Moreover, it is not affected by dry cleaning methods so that it will safeguard draperies, upholstery and other household furnishings during their lifetime.

Parent raw material of the flameproofing chemical is sulfamic acid which while known for more than 100 years, has previously been made only by costly

laboratory processes. Thus its flame-proofing ammonium salt was too high-priced to be readily available to most people.

A method for the large scale production of sulfamic acid has now been devised and put into operation, Martin E. Cupery, chemical engineer of the E. I. du Pont de Nemours and Company, declared in his report to the chemists.

#### "Tailored" Gasolines

Synthetic, tailor-made gasolines which the petroleum chemical industry will

soon be producing in quantities of 550,000,000 gallons yearly mark the fourth, and adult, stage of this major industry.

Dr. Per K. Frolich, director of chemical laboratories of the Standard Oil Development Company, Elizabeth, N. J., in an invited report described the growth of these "tailored" gasolines which are now giving airplanes a 15 to 30 per cent. increase in power take-off and climbing, or a 20 per cent. reduction in cruising fuel consumption when compared with the best previously available fuels.

Science News Letter, April 30, 1938

#### AERONAUTICS

## New Zeppelin Is Described By American Airship Expert

Hindenburg's Successor Will Carry Only 40 Passengers Because Helium Has Less Lift Than Hydrogen

*The airship, dinosaur of the air or future luxury liner of the heavens?*

*In Germany a long line of Zeppelins—more than 100—have gone aloft with such tragedies as the burning of the Hindenburg the exception, not the rule.*

*In America—and England, Italy and Russia—disaster has tagged lighter-than-air craft until Germany alone has an airship industry.*

*Germany has the airships. The U. S. A. has the helium that will hold them aloft without burning or explosion.*

*What does the coming of the new German airship add to airship design and practice? Commander Rosendahl, America's foremost expert, gives the answer in this exclusive article.*

By Comdr. C. E. Rosendahl,  
of the United States Navy

LIKE an aerial Phoenix, rising from the ashes of its predecessor, the newest German airship, the LZ-130, is now nearing completion in its Friedrichshafen hangar. This yet-unnamed air giant will be the first commercial airship in trans-oceanic service which will use helium as its buoyant, lifting gas.

The LZ-130 begins life with an important initial advantage over all its predecessors. It will never be a victim of a flaming hydrogen holocaust such as consumed the ill-fated Hindenburg. Despite some reduction in performance as the insurance premium for the use of safe helium, the fire hazard has been tremendously reduced by the use of non-inflammable helium gas.

In general design, dimensions, construction details and appearance the LZ-130 will be a duplicate of the Hindenburg for there was no fault to find with that air giant's structural form and its airworthiness. Major difference is that the LZ-130 will be lifted by helium instead of hydrogen. The accommodations are no less commodious than on the Hindenburg. In fact, they are superior in many respects.

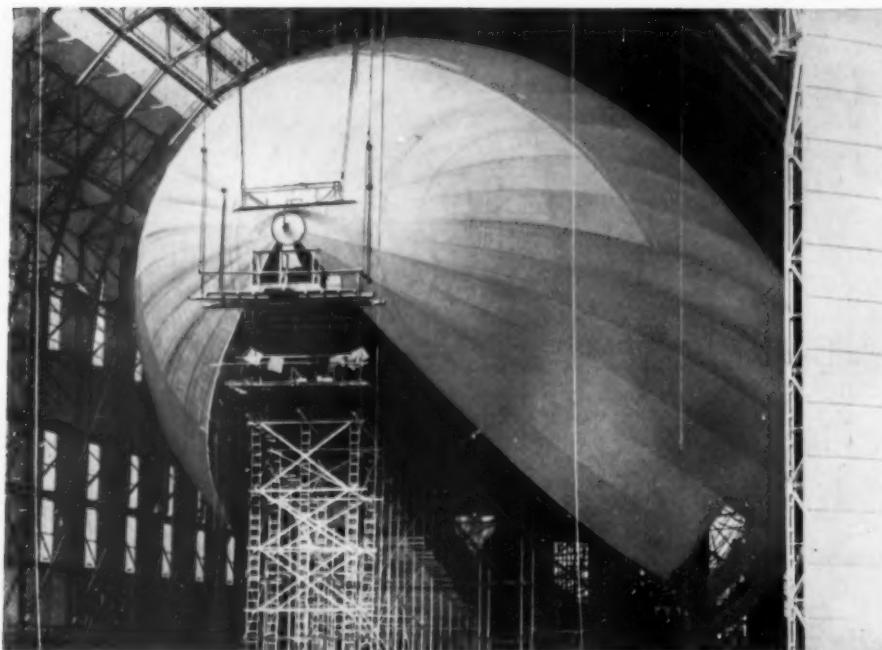
As the LZ-130 now lies in hangar she is 803 feet long, 135 feet in maximum diameter and, when inflated, will hold 7,063,000 cubic feet of gas that will provide a total lifting power of about 200 tons.

When she takes the air, four giant water-cooled Diesel engines will drive her at a maximum speed of 84 miles an hour and with a cruising speed of 78 miles an hour.

These engines will each develop 1,000 horsepower maximum and in normal operation will develop 800 horsepower. The engines are mounted in outside power cars, two on each side of the hull.

Through the LZ-130 run two long corridors, one at the bottom and one at the axis of the zeppelin. The hull is broken up into 16 compartments, or bays, which contain the separate helium gas cells that supply the lift. The inside coating of these cells is a special gelatinous material which has excellent gas-retaining properties.

The main corridor, along the bottom



#### GROWING

*Viewed bow on is the nose of the German Zeppelin, LZ-130, sister-ship of the ill-fated Hindenburg. She is now nearing completion. At this point is attached the mooring cable. At a point corresponding to the bottom part of this picture the control cabin will be later attached.*

of the airship, is the main load-carrying part of the structure. Along its length are located fuel and water tanks, supplies, spare parts, freight and baggage compartments and the crew and passenger quarters.

Three ladders from the lower corridor go up into the axial corridor which, likewise, runs the length of the airship from bow to stern. This corridor permits ready inspection of the gas cells.

The gas cells in shape may be thought of as giant doughnuts or fat balloon tires, for each of them has a small hole in its center through which runs the central corridor. Control valves on the cells permit the release of helium when needed in maneuvering; this set of valves is operated manually from the control car of the airship. Another set releases gas automatically as a safety valve.

#### Diesel Engines

Electric power for the entire airship is generated by two small Diesel engines in a special fireproof compartment along the main lower corridor.

The "nerve center," or bridge, of the LZ-130 is the small control car located forward on the outside and bottom of the ship. Here the actual operation and navigation of the airship occurs. The control car and the four engine cars com-

municate by a mechanical telegraph system. In addition there is a central telephone system connected with every vital part of the airship.

Normally the control of the ship is by hand, through a system of gears and cables running from the control car to the control surfaces. Electric robot power steering is also provided.

The radio room is located immediately above the control car. It is fully equipped for communication on both long and short waves, radio telephone and also has equipment for radio direction finding. In flight, the LZ-130 should be able to "reach" any ship in the North Atlantic by radio.

#### New Luxuries

The most notable change in the LZ-130 is in the layout of passenger quarters. The dining room, located in the center, is flanked on one side by a lounge, reading, and writing room and on the other side by a lounge, smoking room and bar.

Although the dining room is completely within the hull, ample visibility is secured by windows located along the promenades, which extend on both sides of the quarters. These windows, built-in at an angle to provide maximum range of vision, up and down, obviate

the need for artificial lighting in the public rooms during the daytime.

By the use of ingenious aerodynamics, these windows are located in a zone of neutral pressure so that, although they may be kept open at all times, they create no drafts nor allow rain to enter.

Although the Hindenburg was originally equipped comfortably for 50 passengers, its facilities were soon expanded to accommodate 70 passengers because of the demand for transportation. On the new LZ-130 the passenger capacity will be for 40 passengers in North Atlantic service. This reduction is required partly because of helium's lower lift compared with hydrogen, and partly because of certain operating artificialities introduced while helium is relatively more expensive than hydrogen.

#### Daylight Cabins

The LZ-130 has 20 passenger cabins with services resembling those of steamers. In contrast to the Hindenburg, most of the cabins are daylight rooms, and four of them may almost be classed as "luxury" cabins, as they have the large slanting windows as in the public rooms. Each cabin contains an upper and lower berth, a washstand with mirror and hot and cold running water, writing ledge, chair and clothes closet.

For those who like statistics here are some on the LZ-130: Fourteen miles of girders; eighty miles of steel wire; 5,500,000 rivets; 33,000 square yards of fabric in the outer covering and 66,000 square yards of materials in the gas cells.

Science News Letter, April 30, 1938

Do not reduce more rapidly than one and a half pounds in a week, warns a nutritionist at the University of New Hampshire.

Stone Age men 30,000 years ago made the world's first musical instruments out of leg bones of swan, eagle, deer and other creatures.

## RADIO

May 5, 3:00 p. m., E.S.T.

TAMING THE WILD FLOWERS—Dr. P. L. Ricker of the U. S. Department of Agriculture.

May 12, 3:00 p. m., E.S.T.

RARE METALS FIND USES—Paul M. Tyler of the U. S. Bureau of Mines.

In the Science Service series of radio discussions led by Watson Davis, Director, over the Columbia Broadcasting System.

## GENETICS

# Urges Breeding for Animals But Not For Human Beings

## Secretary Wallace Considers That Emphasis on Show Points Parallels Discarded Ways of Corn Judging

BREEDING methods that have greatly improved the per-acre yield of corn will presently be applied to farm animals with equally beneficial results, Secretary of Agriculture Wallace prophesied in the Spragg Memorial Lecture, delivered at Michigan State College.

Secretary Wallace himself pioneered the large-scale application of Mendelian genetical principles to corn breeding, in a day when corn judging was based solely on the production of big, handsome individual ears, regardless of yield per acre. Though he was only a young man, he persisted—in the face of skepticism on the part of his seniors—in producing inbred strains of corn genetically pure for the particular high-yielding qualities he desired, and then crossing them with other pure lines.

This obtained the double advantage of combining the specifically desired qualities and at the same time endowing the offspring with the biological quality, still not well understood, known as hybrid vigor. Millions of bushels of corn are now being raised in the Midwest by the Wallace method, and the use of the hybrid strains is still spreading rapidly.

Breeding of farm animals, such as

dairy cattle, egg-laying chickens, and meat animals, lags far behind corn breeding, Secretary Wallace declared. Selecting breeding stock on the basis of showing "points" is on a level with the old-fashioned methods of corn judging by individual ears. Performance tests based on egg-laying and butterfat-production records are somewhat better, but are still far short of certainty in selection and transmission of desirable qualities to offspring.

What is really needed, the speaker hammered home, is the selection of particular desirable qualities, the fixing of these in pure lines of sires and dams, and the uniting of these pure lines into high-production offspring by crossing. It will be the hybrid corn technique applied to animals.

Carrying of this pure-line method of breeding into application in human eugenics did not appeal to Secretary Wallace as practicable. Negative eugenics, the attempted elimination of undesirable traits by sterilization programs, he considers of dubious workability. Similar techniques failed when applied in early corn breeding, he pointed out.

For the much-advertised "race im-

provement" schemes of totalitarian states he had only scorn. We do not know what human qualities we want to breed for, he said, and it is highly improbable that any human community would submit to rigid mating control for the many generations necessary to produce results if we did know.

"It is definitely a false eugenic idea," Secretary Wallace continued, "to work toward some standardized preconception of the perfect man, such as the 'Aryan Race' of the Nazi mythology. No race has a monopoly on desirable genes and there are geniuses in every race. The fact that the dictator type of mind must inevitably oversimplify its problems, and attempt practical solutions, based on such false premises, can only mean that eugenic progress under a dictatorship will fail in the long run. Man does not live by bread alone, nor by genes alone . . . .

"No board of experts can tell a dictator how to breed a genius, nor indicate what kind of children our genius would have—if any. Were this possible we feel sure that a genius-breeding program by decree (even a decree buttressed by 99.75% of the 'electorate') could only offer the kind of environment from which the best inheritance would bear only bitter fruit.

"If the eugenic outlook in democracies is today as bad as some eugenicists feel, the solution is thus seen to lie not in an appeal to dictatorship but in the development of a kind of social environment in which superior individuals feel that life has values and possibilities which it is a privilege to pass on to one's children."

Science News Letter, April 30, 1938

## METEOROLOGY—AVIATION

## French Steamer In Atlantic To Supply Weather Data

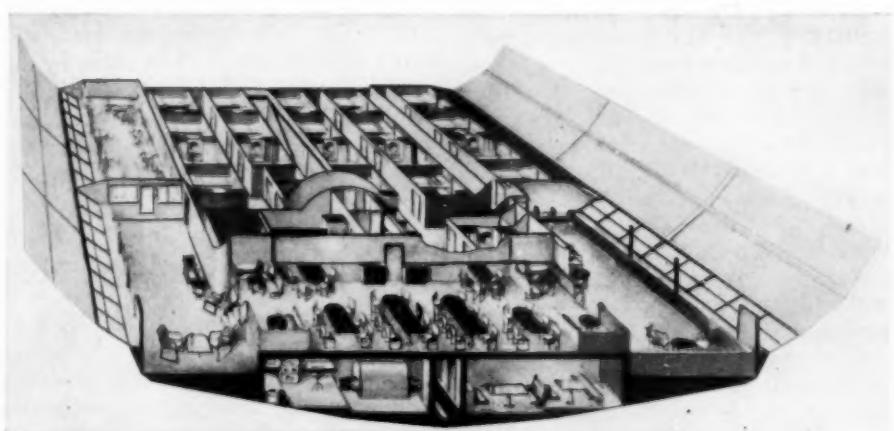
THE FRENCH steamship S. S. *Carimare* will be stationed in mid-Atlantic until June to furnish weather data for trans-Atlantic flying and for regular maritime purposes, it is announced at the Hydrographic Office of the U. S. Navy.

The service to be conducted by the steamer will be similar, it was stated, to that provided by the S. S. *Jacques Cartier* in the past. Ships are asked to radio weather reports to the *Carimare* at midnight, six a. m., noon and six p. m. Greenwich Mean Time.

Science News Letter, April 30, 1938

Geysers have rather brief careers compared to most geological phenomena,

## INTERIOR



Artist's drawing shows the arrangement of public rooms and passenger quarters on the new German Zeppelin, LZ-130. In the foreground is the galley, the large dining room and the lounge, bar and smoking room. At the top right of the picture are the "luxury" cabins with outside windows.

## PUBLIC HEALTH

**Undulant Fever More Widespread Than Supposed**

UNDULANT fever, acquired generally from drinking raw milk from infected cattle, is probably more common than generally supposed, Drs. Fred E. Angle and William H. Algie of Kansas City, Kans., reported to the American College of Physicians. They found evidence of a mild chronic form of this condition in over one-third of a group of 426 Kansas City school children. Tests made at the same time as routine for tuberculosis showed a surprisingly large number possibly infected, and questioning of parents of these children revealed that many of them complained chronically of nervous symptoms such as appear in undulant fever.

*Science News Letter, April 30, 1938*

## PHYSIOLOGY

**Asthma From Feathers Was Reported in 16th Century**

THE IDEA that a man can get asthma from sleeping on a feather pillow is still a novel idea to many laymen, although this and other forms of allergy are threatening to replace operations and "organ recitals" in everyday conversation.

Actually, a case of asthma was attributed to feathers and cured by removing the feather bed as long ago as 1575. In that year Jerome Cardan, a great physician of Padua, was called to Edinburgh to see the Archbishop who suffered from asthma. The Paduan physician probably had no idea of allergy, or hypersensitivity to feathers, such as physicians have today. Certainly he was not able to make skin tests of his distinguished patient. But Cardan was able, as good physicians have always been, to observe and study his patient carefully and to make logical deductions from his observations. Cardan finally advised the Archbishop to give up certain articles of his diet and to get rid of his feather bed. Relief of the asthma promptly followed.

The story is retold by Louise Stedman and Merle Ford in a report to the *Journal of Home Economics*. The report concerns itself with textiles which, like feathers, plant pollens and foods, can cause asthma, hay fever, migraine headaches, hives or other forms of allergy.

Cotton, silk, wool, kapok, rayon, leather and rubber can all cause allergic symptoms in hypersensitive persons, but

of the fabrics silk seems to cause most trouble. Cottonseed and flaxseed or linseed are troublesome in cases where cotton or linen fabrics may not be. Kapok may not cause symptoms at first but when the fibers become dry and brittle they cause a fine dust which may be troublesome. Dyes used in fabrics are often allergy-causing in themselves. Rayon waste is said to be one of the safest non-allergic upholstery stuffing materials. Smooth fabrics can often be tolerated when a rough weave of the same material causes trouble.

*Science News Letter, April 30, 1938*

## CHEMISTRY

**Magnesium Extracted From Sea Water Constituent**

A NEW process for the production of magnesium, feathery-light metal whose successful and cheap extraction would presage an industrial revolution, has been patented in the United States by a German inventor.

Differing from previous extraction processes in that it starts with magnesium chloride, a constituent of sea water, instead of one of the common magnesite ores, the process uses hydrogen to combine with the chlorine of the magnesium chloride. Metallic magnesium is the result.

Patent No. 2,111,661 has been awarded to Karl Ebner, who comes from a small town near Frankfort-on-the-Main, Germany. He has assigned the patent to the American Lurgi Corporation of New York City.

The relatively low furnace temperature of 1200 to 1500 degrees Centigrade is all that is necessary to make the process operate, Mr. Ebner states. He contrasts that with the high temperatures required in other processes.

Production of magnesium has been the goal of research workers all over the world for, with its extremely low weight and other desirable qualities, it can be used in the manufacture of alloys even superior to aluminum alloys. Further interest is added by the fact that bauxite, the ore from which aluminum is extracted by present processes, is not counted a common ore.

"The magnesium is recovered by condensation from the gaseous products of the reaction leaving a mixture of hydrogen and hydrochloric acid, which hydrogen, after separation of the hydrochloric acid, may be returned to the process," Mr. Ebner points out as an economical feature of his method.

*Science News Letter, April 30, 1938*

# IN SCIENCE

## ANTHROPOLOGY

**Bow-Legs and Cross-Eyes Early American Beauty**

BOW-LEGS and cross-eyes sound like a misfortune. It is hard to imagine a civilization that would admire them.

Yet that is what Spanish explorers found when they came to Yucatan in the sixteenth century and wandered into the busy, beautiful cities of the Mayan Indians.

Here were New World natives who could read and write and do clever things in architecture and sculpture. And they had such strange notions of beauty, deforming themselves into freaks!

A vivid little description of early American aesthetics is given by Yucatan's observant missionary, Bishop Diego de Landa, in his writings, now translated into English by Dr. William Gates and published by the Maya Society.

The missionary found Mayan Indians tall, robust, cross-eyed and bow-legged. The latter trait he attributed to their custom of carrying babies around. A Mayan youngster rode on his mother's hip pick-a-back fashion so long that his pliant leg bones took on a permanent curve.

But, while bow-legs just happened to Mayas, the cross-eyes were their own idea.

As Bishop Landa explained it: "It was held to be a grace to be cross-eyed, and this was artificially brought about by the mothers, who in infancy suspended a small plaster from the hair down between the eyebrows and reaching the eyes; this constantly binding, they finally became cross-eyed."

Not content with this, Mayan Indians also craved a profile in which the forehead sloped back and up in a peak. This could be done by binding the head of an infant a few days after birth.

Queer shaped humans seen in Mayan sculptures, therefore, are not prehistoric surrealism or other art vagaries. The degenerate looking profiles were classic Mayan beauty, to be included in beauty history along with the Chinese lily-foot, the wasp waist and the debutante slouch.

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## SCIENCE FIELDS

## PHYSIOLOGY

**Fluffy Week-Old Chicks  
Made to Strut and Crow**

**W**HAT would you think if one of the fluffy little new-hatched chicks that you bought as an Easter present for the kids had suddenly begun to strut around and crow like a grown-up rooster?

That is the astonishing behavior of week-old chicks demonstrated before the meeting of the American Association of Anatomists in Pittsburgh, by Dr. James B. Hamilton of the Yale University School of Medicine.

Dr. Hamilton injected a synthetic compound capable of causing masculine behavior in animals, known as testosterone propionate, into chicks as soon as they were hatched, and kept it up daily for eight days. At the end of that time, he reported, "complex actions such as crowing and strutting were carried out even though the under-developed voice organs seemingly do not lend themselves to mature polypitch vocalization."

Something just about as premature in the way of natural sex development (though of course an abnormal condition) is the case of a baby girl, two years and two months old, reported by Dr. J. Leroy Conel of Boston University School of Medicine. The child has the weight of a five-year-old, bone development equivalent to a girl five and one-half years old, and a sex age of twelve years.

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## PHYSICS

**Test For Surface Accuracy  
Magnifies 50,000 Times**

**A**HUMAN hair about 15 feet across. That is what it would be if it were magnified with one of the latest testing devices for automobile parts.

One of the wonders of modern mechanical engineering is the routine measurement of finely finished surfaces so smooth that magnification of the order of 50,000 times is necessary. So exacting have become the demands of modern machine shop practice that the working surfaces of anti-friction bearings, for

instance, require great accuracy and smoothness. Surface irregularities less than a hundred thousandth of an inch (10 microinches) are sufficient cause for rejection.

A machine that measures so finely with the rapidity necessary in actual production, has been achieved. The profilometer, as it is called, has a tiny point that traces the almost molecular surface irregularities. This varies the current flowing through a magnet and this current is sent through special amplifiers and circuits. Thus, electrically, there is created that high magnification necessary. The magnified replica of the surface desired is the light-written record of the oscillograph into which the current is fed. If a permanent record is desired, a motion picture camera is aimed at the waving light line of the oscillograph.

How far machine shop precision has traveled during the age of power will be realized when it is recalled that Watt, inventor of the steam engine, was elated when he found that Wilkinson's boring mill could machine an engine cylinder true to within the thickness of a shilling.

The dawn of precision in machinery came when the system of interchangeable parts was adopted early in the last century. Arms factories in Connecticut pioneered in measuring accurately with gages.

With accuracy increased many fold, this is the principle that underlies the machine age of today.

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## SEISMOLOGY

**Turkish Quake Located  
By U. S. Scientists**

**T**HE EARTHQUAKE that shook interior Turkey on Tuesday, April 19, had its epicenter in latitude 39 degrees north, longitude 33 degrees east (approximately), the U. S. Coast and Geodetic Survey informed Science Service after examining data from six seismological observatories. The point located is near the capital city, Ankara (Angora). Time of origin was 5:59.4 a. m., E. S. T.

Stations reporting were: Manila Observatory, Manila, P. I.; Dominion Meteorological Observatory, Victoria, B. C.; observatories of the Jesuit Seismological Association at Fordham, St. Louis, and Georgetown universities, and the observatory of the U. S. Coast and Geodetic Survey at San Juan, P. R.

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## PHYSIOLOGY

**Dose of Poisonous Chemical  
Rob Sheep of Their Wool**

**O**UT OF Moscow, by way of London, comes a research story that puts even electric razors to shame. It concerns the shearing of sheep. A chemical is used to rob the sheep of their wool.

The scientist experimenting is N. A. Iljin of the Soviet's Wool Laboratory. Building upon the research of others, Iljin found last year that he could by single doses of thallium compounds make sheep shed their wool, leaving them naked as if they had been shorn. This is particularly effective for such sheep as those of the merino variety with uniform fine curling fibers.

Now he has discovered a way to apply the thallium molt to those less improved, more hardy sheep with mixed wool, whose fiber has been of little value because it is largely coarse and not uniform. If the thallium dose was small, only about 9 milligrams, the fine wool predominately fell out, if it was 12 to 13 milligrams both coarse kemp and fine fibers molted. This may possibly have economic importance.

There are difficulties, however, for thallium is a metal poisonous to plant and animal life. Iljin warns of "certain harmful by-effects" and in past years warnings have been issued here in America as to its danger. Numerous deaths followed use of thallium compounds in depilatory preparations. It removed hair with such great efficiency that those who used it became bald. Effective in fighting rodents and insects, even this use is discouraged because of the danger to human beings. So there is no possible application to the problem of human shaving.

The Soviet scientist, however, has conducted his experiments more for the sake of biology than the wool industry. He calls selective molting in his sheep an example of the analysis of living matter by means of chemical action. Different doses of thallium promise to distinguish between sheep of different genetic strains. Selective molting is considered by Iljin "a proof of the possibility of a physiological distinction between morphologically different structures," a sort of chemical filter for unscrambling the mixtures blended by heredity.

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## ENTOMOLOGY

# Grasshopper War Due to Break Along Wide Front in West

## Scientists Now Marshalling Defense Forces Armed With Millions of Pounds of Poison Ammunition

**W**AR on a wide front will break out in the American West this spring. From below the Mexican border to beyond the Canadian line, hordes of enemies menace our Prairie and Plains regions. Already, from headquarters, the officers of our defense have moved into the field, to recruit their forces, and Congress has appropriated a war fund for the procurement of munitions.

The enemy are grasshoppers, now about to arise in billions from the soil, to advance on fields and pastures, devouring as they go. Defense will be maintained by scientists of the U. S. Department of Agriculture and the various states, and by thousands of farmers, foresters, and other units of Western manpower.

Greater than ever before in the memory of living men is the menace of

grasshopper hordes, in this spring of 1938. But the defense forces are not dismayed. By the time the enemy swarms appear they will be in position and ready to meet them, with adequate weapons of chemical warfare, well distributed.

The situation is different from what it has been in recent grasshopper years, when for one cause or another the anti-hopper campaign has been delayed, and had to be carried out on an emergency basis after the best time for stopping the insects had passed.

This time the hopper-fighters are getting the drop on their enemies. They are in the field before the grasshoppers emerge, and to the money left over from last year's emergency fund there has recently been added a new Congressional appropriation of \$2,000,000.

The one time grasshoppers can be fought with real effect is in the spring. In winter they are safe, as eggs in the soil. Winter cold and ice do them little damage, and even deep fall plowing will not make any decisive cut in their numbers.

Later, when spring passes into early summer, the young grasshoppers get their wings, and so are able to make long leaps, clear over man's defenses. That is why the scientists have been eager to be up and at 'em during the coming few weeks.

### Crawling Infancy

When the grasshoppers hatch from the masses of over-wintering eggs just beneath the surface of the soil, they are wingless and quite small—no bigger than ants. They crawl over the ground in enormous mobs, feeding as they go. They grow rapidly, and change their skins several times. After the last change they are winged, full-grown insects, ready for making real trouble.

During this wingless, crawling juvenile stage they are most vulnerable, both to the elements and to the attack of man. Cold, beating rains are always hoped for about mid-spring during grasshopper years. Such weather hammers them into the earth and drowns them, and it also

weakens them to the attacks of natural enemies, such as predatory insects and fungi that cause fatal sickness in their ranks.

But mankind, with farms and ranches to defend, cannot depend on so capricious an ally as the weather. The critical weeks may be warm and sunny instead—paradise-weather for young grasshoppers. So the defense forces seek out the masses of crawling grasshopper "infantry" and spread before them tempting Borgia-banquets of bran flavored with arsenic. The hungry little hoppers feast—and die.

Of course, the younger the grasshoppers are when they find these lethal rations, the less it takes to kill them. Economy of government funds is one of the motives that impels the defensive forces of science to get into the field good and early.

Another economy has been achieved within the last couple of years. Hitherto the formula called for a 100 per cent. bran base for the poison bait. But it has been discovered that a mixture of one-quarter bran and three-quarters sawdust will be eaten by the grasshoppers just as readily. Sawdust, of course, is vastly cheaper than bran.

### Mountains of Bait

The quantity of poison bait needed is staggering, at first glance. Last year the hopper-fighters spread 80,000 tons of it—the weight of two super-battleships. This year there are so many grasshopper eggs in the soil ready to hatch that the estimate calls for just double that quantity.

This seems like a terrific mountain of bran-sawdust-arsenic, and indeed it is; but when it is noted that it must be spread in effective spots all the way from Michigan to western Washington, and on south to southern California and central Texas, it doesn't loom quite so mountainous after all.

The worst infestations are all over the state of Iowa, the eastern half or two-thirds of the Dakotas with parts of Wyoming, Colorado and Wisconsin. Minnesota got into the fight earlier and harder than other states, or the plague might be more severe than it is in its southern half. Minneapolis has been chosen as national field headquarters for the grasshopper war.

Our grasshoppers are zoological cousins of the locusts that were one of the worst of Egypt's classic plagues. The troublemakers are not all of one kind. Four species of the long-legged insects do most of the damage in the great farm areas. The situation among the grasses



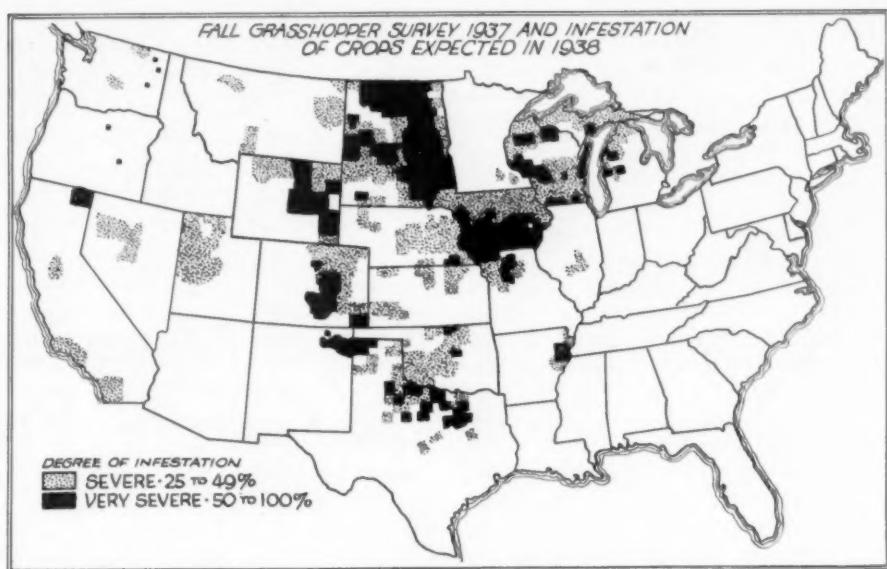
THE ENEMY RESTS

Having stripped the grassblades to their midribs and denuded the bushes of their leaves, the swarming insects roost on the naked stems to bask in the sun.

and herbs of the Western range lands is much more complex; some 25 or 30 distinct species of grasshoppers feed upon them, robbing cattle and sheep. Each of these species has its own habits and food preferences, so that the grasshopper-entomologist's life is not an easy one.

The grasshopper's history goes a long way back of Moses. The group of insects to which it belongs is reckoned as one of the more primitive ones, and includes other similar insects such as katydids and crickets. Wings and parts of bodies of the grasshopper cousinship have been found in geological deposits dating back scores of millions of years. Dinosaur and saber-tooth tiger have come and gone, but the grasshoppers we have always with us.

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## From Page 279

afflicted with arthritis include cat, cow, deer, bear, hyena, baboons and anthropoid apes. It was not found among certain carnivora, notably the dog group; rodents and bats seem likewise to be immune.

"The ease of discovery of the disease in hyenas and gorillas should be emphasized," Prof. Fox remarked. "There is a strongly suggested similarity between the arthritis of the lower animals and that of the deforming and rheumatoid arthritis in man."

### Lindbergh's "Heart" Ready

Col. Charles Lindbergh's invention, the "glass heart", has been used in over 900 experiments, totalling about 100,000 hours, to keep alive a large variety of organs from human beings and lower animals, Dr. Alexis Carrel of the Rockefeller Institute announced. He added:

"The method has reached the stage where it can be profitably applied to many problems in the fields of anatomy, physiology, biological chemistry, and pathology."

Among organs kept alive and working, for periods varying from two to thirty days, were hearts, lungs, livers, kidneys, spleens and other glands, arteries, veins, nerves, muscles, joints, and reproductive organs including pregnant uteri. The hearts kept on beating, the glands continued to secrete, and other organs continued their functions in the circulating medium. (See SNL, June 29, 1935.)

By modifying the chemical composition of the fluid, especially by the addition of insulin, adrenalin, and other glandular extracts, it became "possible to



ON A LOST BATTLEFIELD

*Too late to do anything for what was once a prosperous cornfield, scientists and farmers survey the damage and plan reprisals for next season.*

study how the morphological and physical activities of an organ are related to physicochemical conditions of its medium," Dr. Carrell stated.

### Brain Waves Vary

Different parts of the head give rise to different kinds of brain waves, it was reported by Prof. E. Newton Harvey of Princeton University and Dr. Alfred L. Loomis and Garret Hobart of the Loomis Laboratory, Tuxedo Park, N. Y.

Brain waves are detected by setting light metal disks against various parts

of the skull and amplifying a million times the slight fluctuations of potential they set up. These waves have been used in the study of widely diverse phenomena such as sleep, hypnotism, epilepsy, etc.

The shapes and amplitudes of the brain-wave traces from the ear region are quite different from those obtained by placing the electrodes on top of the skull or at its sides. Patterns from corresponding positions on right and left sides of the center line usually correspond with each other, but at times a dis-

turbance may appear on one side and not on the other.

"Potential distribution over the human brain can be visualized by comparison with the disturbances in a slowly boiling liquid in which bubbles of gas are continually rising to break in ripples at the surface," said Prof. Harvey. "Large bubbles give rise to large slow waves while small ones give rapid rhythms.

"Sometimes the disturbance occupies a large area, sometimes a small. Bubbles appear in a nearly symmetrical pattern on right and left although a longer lasting disturbance, or one over a larger area, may occasionally occur on one side only. On the other hand, front and back show marked differences. In general many small bubbles arise at front (beta rhythms) and the medium size very regular bubbles at back (alpha rhythms). The distribution is continually changing.

"The pattern alters completely as sleep begins, passing through a definite sequence of changes until finally the whole liquid is pulsating to large regular bubbles about one a second."

#### Chilled Eggs Abnormal

Chilling the eggs of some of the lower animals causes abnormal development when they are restored to normal temperatures, Prof. Edwin G. Conklin of Princeton University told the meeting.

Prof. Conklin explained the mechanism of the changes as due to interruption of the normal whirlpool-like streaming of protoplasm in the eggs. Under ordinary circumstances this little whirlpool of life arranges the developing parts, but when it is temporarily stopped, cell division continues without its directive influence, and a state of biological anarchy results in the developing animal.

#### Australian Tribes Described

Primitive black natives of Australia were not without political organization, but such as they had was of the very simplest, Prof. D. Sutherland Davidson of the University of Pennsylvania explained.

The basic unit has been named the horde. It is a loose organization of from thirty to fifty closely related individuals who occupy a well-defined territory of varying extent, over which they exercise complete autonomy.

"Since the pre-European population of Australia is estimated to have been between 250,000 and 300,000 there must have been between 5,000 and 10,000 independent political entities on the continent, an astonishing condition when

compared with the aboriginal situation in other parts of the world," commented Prof. Davidson.

There was no higher organization in the sense of a central controlling government, but the natives did recognize larger groupings of hordes which were named on the bases of speech and cul-

tural practices and of territorial contiguity. These larger groupings contained from a few to several dozens of hordes each, and are considered as tribes.

Prof. Davidson has compiled a register of the tribes and hordes, under a grant from the American Philosophical Society.

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#### POPULATION

## Racial Minorities, Not Those Of Culture, Problem in U. S.

RACIAL minorities, rather than national minorities, are America's problems, says Dr. Richard Hartshorne, University of Minnesota geographer, describing in the *Geographical Review* (April) the minorities in America and their distribution.

Europe's minority groups are largely cultural, so that the barber and tailor can change outward appearances in a few minutes. In America, the minorities are racial, and no beauty shop can make the descendant of a Negro slave who arrived in Virginia before the Pilgrims landed look very much like a white man. Thus Dr. Hartshorne describes the difference between Europe's and America's minority problems.

Only in a few localities, his researches show, is any other language than English (American) spoken by a majority of the inhabitants. Our racial minorities include the Negro, once imported as cheap labor; the Indian, an original inhabitant, who has been slowly forced out of the fertile lands into the desert; the Mexican, who came here as a laborer, or was a resident of Mexican territory ceded to the United States; and the Oriental, who came as cheap labor.

Each minority stays pretty close to some section of the country, so that in general, only one minority is of any importance in a given district. Thus, the Negro is the specific problem in the Southeast, the Mexican of the far Southwest, the Oriental of the Pacific coast, and the native Indian of the Southwest. Most members of the colored (non-white) races live in the seacoast and border states from southern New Jersey to northern California.

Mexican and native Indians, forming a large majority of the population in some parts of the Southwest, do not today feel any community of race, but "continued ostracism by the white pop-

ulation may lead to such feelings," concludes Dr. Hartshorne.

Intermixing of the eastern Oklahoma Indians and the Negroes of the same area, begun more than 200 years ago, will probably continue, resulting in a mixed colored race. Another minority, not racial, but sometimes treated with similar discrimination, consists of foreign-born persons. Their children, born in this country and educated in our schools, in general become full-fledged Americans, says Dr. Hartshorne; although some of the American-born descendants of southern European immigrants, brought up in foreign quarters of our large cities, are discriminated against as being un-American. Those born in other countries, says Dr. Hartshorne, are popularly classified as "furriners," and like all colored peoples, are not included as "100 per cent. American."

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#### GENERAL SCIENCE

### New Service To Prevent Bibliography Duplication

A NEW intelligence service for scholars engaged in research is being inaugurated by Dr. Henry B. Van Hoesen, librarian of Brown University, who is secretary of the Bibliographical Society of America.

When the marshalling of references begins in connection with a research, the Bibliographical Society will carry a notice to its members telling by whom and where the bibliography is being prepared. Others working in the same field will be saved the trouble of duplicating the same compilation.

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There are ten veterinary colleges in the United States.

## ASTRONOMY

# Two Eclipses

## Month of May Brings First Eclipses of 1938; Total Of Moon To Be Visible in U. S.; Solar One Unpromising

By JAMES STOKLEY

THE MONTH of May brings the first two eclipses of the year 1938, though only one is visible in the United States. This is a total eclipse of the moon, which will happen in the early morning hours of Saturday, May 14. At that time the moon will be darkened as it enters the shadow of the earth and its normal supply of sunlight is reduced.

Because the sun is not a mere point of light, but covers an appreciable area of the sky, the shadow of the earth is divided into two parts. There is an outer region, called the "penumbra," in which an observer in space would see the ball of the earth only partly hiding the sun. The core of the shadow is the "umbra," where the earth hides the sun completely. This is not, however, entirely dark. The air around the earth acts as a prism, to bend the light rays from the sun into the umbra. As these rays penetrate the atmosphere, some of the blue light is scattered, giving the sky its familiar blue color. The blue rays extracted, those which continue are predominantly red. These fall on the moon even while totally eclipsed and give it a coppery red hue. An observer on the moon at this time would see a brilliant ring of red light around the dark disc of the earth.

### Time Table

Following is a time-table of the eclipse that occurs during the night of May 13, and in the early hours of the 14th:

12:44 a. m., E. S. T. 11:44 p. m., C. S. T. 10:44 p. m., M. S. T. 9:44 p. m., P. S. T. Moon enters penumbra, little change at first but after half an hour it begins to look noticeably fainter, especially at the eastern edge.

1:57 a. m., E. S. T. 12:57 a. m., C. S. T. 11:57 p. m., M. S. T. 10:57 p. m., P. S. T. Moon enters umbra, the curved edge of the earth's shadow across the moon, from east to west.

3:18 a. m., E. S. T. 2:18 a. m., C. S. T. 1:18 a. m., M. S. T. 12:18 a. m., P. S. T. Total eclipse begins as the moon is completely engulfed in the umbra and assumes the coppery color.

4:09 a. m., E. S. T. 3:09 a. m., C. S. T. 2:09 a. m., M. S. T. 1:09 a. m., P. S. T. Total eclipse over as the moon begins to emerge from the umbra. Again the curved edge of the earth's shadow can be seen on the moon's face.

5:31 a. m., E. S. T. 4:31 a. m., C. S. T. 3:31 a. m., M. S. T. 2:31 a. m., P. S. T. Moon leaves umbra, and the disc of the full moon gradually resumes its normal appearance.

6:43 a. m., E. S. T. 5:43 a. m., C. S. T. 4:43 a. m., M. S. T. 3:43 a. m., P. S. T. Moon leaves the penumbra, eclipse entirely over.

Only in the western half of the country will the eclipse be seen in its entirety, for the sun rises, and the moon sets, about 4:45 a. m. Twilight starts, on this date, about an hour and a half before sunrise in most parts of the country, so even in the west the sky will already be light before the eclipse ends.

Fascinating though they are to watch, eclipses of the moon are of relatively slight scientific importance. Quite different are total eclipses of the sun, for there are many observations that can only be made when the moon's shadow crosses the earth. On this account, astronomers often travel half-way around the earth to reach the narrow path where one can be seen.

The total eclipse of the sun on May 29, however, will not attract any ex-

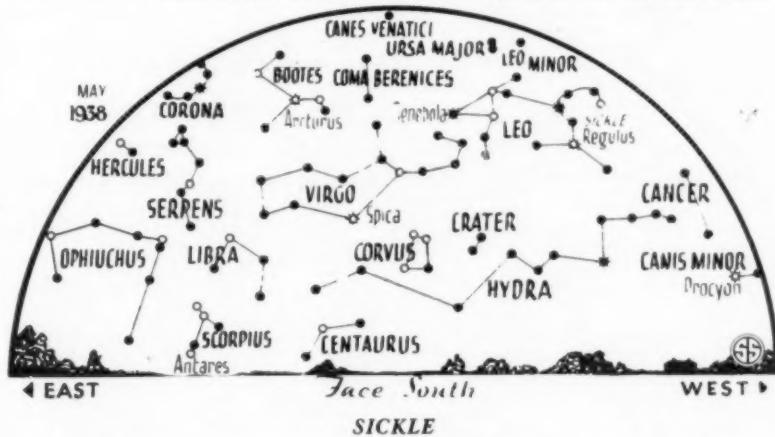
peditions, even though the sun will be covered at the central part of the path for more than four minutes, which is quite long. The trouble is that the path of totality is in the far south Atlantic Ocean. A few inaccessible islands, the Sandwich Group, the South Orkneys and South Georgia, are the only land from which the eclipse is visible, and none of these are placed so that the full duration will be obtained. Even this might not be a barrier, for Canton Island, to which the U. S. Navy sent an expedition on a special ship last year to observe the total eclipse in June, was scarcely more accessible, and the astronomical conditions not very much better.

### Bad Season

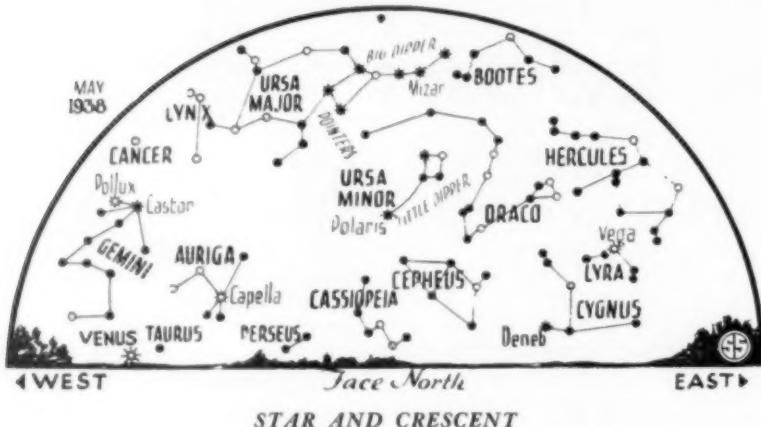
Added to its other disadvantages is the fact that there seems very little chance of good weather for the May 29 eclipse. It must be remembered that the seasons in the southern hemisphere are the reverse of ours. Instead of being almost the beginning of summer, down there it is approaching the beginning of winter. And these islands are as far south of the equator as Labrador is to the north. Labrador at the end of November would not offer very favorable chances for eclipse observations and neither do the South Orkneys in May.

This eclipse, however, marks the first total one in a long series which will be extraordinarily fine during the 21st and 22nd centuries. An eclipse recurs under somewhat similar conditions, after a period of 18 years 11 1/3 days, called the

### \* \* \* SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS



Now one of the most prominent constellations is Leo the lion with its famous Sickle.



*Beautiful sight of the early evening sky on May 1 will be the close approach of the planet Venus and the narrow crescent of the new moon.*

saros. Already about a dozen have occurred in the series of which this is part, the last in 1920, but all have been partial, with the moon's umbra missing the earth. Now, for the first time, the shadow touches the earth, and the eclipse is total. When it next happens, on June 8, 1956, it will be longer and farther north, and then, perhaps, men will begin observing it.

Early on the evening of May 1 an interesting sight will be seen low in the west, as the narrow crescent of the young moon passes close to the planet Venus. Then, at 7:00 p. m., E. S. T., on May 7, Venus will pass extremely close to the planet Mars. The two planets will then be separated by a distance of about a fifteenth of the moon's diameter. Mars is now quite faint, of the second magnitude, while Venus is getting bright, and is of magnitude minus 3.3, far more brilliant than any other star or planet. Therefore, Mars will not be very conspicuous to the naked eye, but a pair of binoculars will show it quite clearly. For several days before and after the seventh,

they will be fairly close, and worth looking at in case of bad weather on the seventh.

Most brilliant among the stars or planets visible in the evening skies during May is Venus. This planet can be seen in the west even while twilight is still fairly bright. By the time it is dark, Venus has descended close to the horizon, and it may be mistaken for a lighthouse or an air beacon, so brilliantly does it shine. During the spring and summer it will continue to brighten, until, in September, it will be more than twice its present splendor.

Mars is the only other planet visible in the evening sky, but it is very faint, and thus is not shown on the map. It is nearly on the opposite side of the sun from the earth, at a distance of 225,490,000 miles on the first of the month. Venus is moving rapidly toward the east, and it passes Mars on the seventh.

In the southeastern morning sky, just before sunrise Jupiter appears. Saturn and Mercury this month are too close to the sun to be seen.

Among the stars, which are really far distant suns, the constellation of Leo, the lion, is one of the most prominent. As shown on the accompanying maps, which give the arrangement of the skies at about 10:00 p. m., May 1; 9:00 p. m., May 15, and 8:00 p. m., May 31 (all in standard time), it is high in the southwest. The western part of the group forms the "sickle," which has Regulus at the end of the handle. To the left is brilliant Arcturus, in Bootes, the bear driver. Below is the figure of the virgin, Virgo, in which Spica shines. Still lower, and farther to the left, is Scorpius, the scorpion, which is just beginning to appear above the horizon. Its most brilliant orb is Antares, famous for its red color.

To the west one can see Procyon, in the constellation of the lesser dog, Canis Minor. Next to this group, to the right are the twins, Gemini, with the brightest stars called Castor and Pollux. Then, continuing around to the north, we find Auriga, the charioteer, with Capella. In the northeast are two more stars of the first magnitude. Vega, in Lyra, the lyre, is the most brilliant seen in this direction. Below the lyre is the swan, Cygnus.

The big dipper, part of the great bear, Ursa Major, is now high in the north. The pointers, the stars in the dipper's bowl away from the handle, show the direction of Polaris, the pole star, itself in Ursa Minor, the lesser bear, and forming the end of the handle of the little dipper. Below the pole star, in its poorest position of the year, is Cassiopeia, the queen, shaped like a letter W.

#### Phases of the Moon

E.S.T.

First quarter	May 6	4:24 p. m.
Full moon	May 14	3:39 a. m.
Last Quarter	May 22	7:36 a. m.
New Moon	May 29	9:00 a. m.
Perigee	May 2	8:00 a. m.
Distance—225,900 miles.		
Apogee	May 18	4:00 a. m.
Distance—251,900 miles.		

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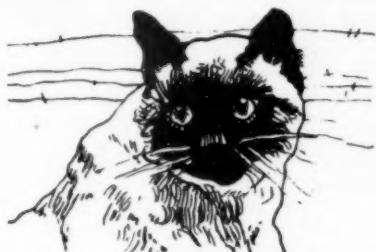
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Cats and Dogs

**W**HOOVER first called the cat *Felis domestica* and the dog *Canis familiaris* either didn't know or chose to ignore their respective characters. For it is the dog that is really the domesticated animal, and the cat that is at most a "familiar."

A really domesticated animal might properly be defined as one that is always the property of a human owner, practically never being found in the wild state. Such an animal, moreover, is obedient to its owner, rendering services on command, provided of course, that it is intelligent enough. A domesticated animal reaches its highest level if it also shows loyalty to its master.

The dog fits this definition admirably; he is *par excellence* the domestic animal, surpassing even the horse.

The cat, on the contrary, renders no services (except to catch mice for her own eating) and certainly yields no obedience. She is proverbially independent-minded, indifferent to the humans who fancy themselves her owners. Some students of cat-ways declare her attachment is not to persons in a family but to the place where they live. She merely consents to share her domicile with them, and to accept food from them if they choose to give it.

Zoologists have a special name for wild animals, if by patience and forbearance and gifts of food a human being succeeds in gaining their confidence. It can be done, with varying degrees of difficulty, with such wild things as squirrels, rabbits, beavers, even skunks. The zoological name for such a half-tamed creature is a "familiar."

It may fairly be asked, is the cat really anything more than a rather common "familiar" animal? And shouldn't zo-

ologists be asked to swap Latin names between dog and cat?

In partial excuse for Pussy, it might be urged that Fido has been domesticated a great deal longer than she has. Dogs came into man's household while he was still living in the caves of the Old Stone Age, cats at a considerably later period, probably rather late in the New Stone Age, after civilization had made really substantial beginnings. There

are plenty of primitive peoples who have no tame cats, but no tribe of mankind anywhere on earth, is without its domestic dogs.

So maybe after another ten or twenty thousand years Pussy will have earned her name of *Felis domestica*. But in the meantime, though you may send Fido to the meat market to bring home the chops, better not trust Puss to guard the goldfish.

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## MEDICINE

## Chemicals Produce Reaction In Non-Tuberculous Animals

### New Step Toward Better Understanding of White Plague Described Before Meeting of Anatomists' Association

**T**HE FEAT of using two chemicals obtained from tuberculosis germs to make animals give a positive tuberculin test, even though they are not tuberculous, was reported by Drs. Florence R. Sabin and Austin L. Joyner, of the Rockefeller Institute for Medical Research, New York, to the meeting of the American Association of Anatomists in Pittsburgh.

The research, which is part of the mass attack on tuberculosis launched by the National Tuberculosis Association and leading research institutions, brings scientists one step further in understanding how the tuberculosis germ causes disease. They hope this means also that they are one step closer to final conquest of the white plague.

The tuberculin test, familiar to thousands of parents and school children as a routine measure for detecting early tuberculosis in the children, is accepted as giving indication of the presence of living tuberculosis germs. It has been possible to make animals such as guinea pigs susceptible to tuberculin, even though they have no tubercle bacilli in their bodies, by injecting the protein fraction of the tubercle bacilli. Enormous quantities of this protein material, however, and much time are needed to produce this result.

Drs. Sabin and Joyner reported that they have found they can produce the same response in non-tuberculous guinea pigs very much faster if they inject a mixture of the protein from the bacillus with a fat-containing phosphorus substance also obtained by chemical breaking down of the tubercle bacillus.

The chemicals used in this work were obtained from living tubercle bacilli in the Yale University laboratories of Dr. R. J. Anderson. Dr. Anderson has obtained many other chemicals from the TB germs. Dr. Sabin, by injecting each of them alone and in combination into guinea pigs, hopes eventually to learn which chemicals are responsible for the different symptoms of tuberculosis, such as the fever, the cheesy masses in the body tissues, called tubercles, and other symptoms. She even hopes to be able to produce germ-free, chemical tuberculosis in the animals.

The great hope is that when all this has been learned, it will be possible to find ways of negatizing each of these symptom-producing chemicals—in other words, to have one or more specific chemical remedies for curing tuberculosis.

A single step toward realization of this hope is what Dr. Sabin reported at the meeting.

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# \*First Glances at New Books

## General Science

WORLD BRAIN—H. G. Wells—*Double-day, Doran*, 194 p., \$2. This is nothing less than the blueprint, or rather the architect's preliminary rendition, for a modernization of the intellectual organization of the world. Mr. Wells' essays are urgent and provocative contributions to a scientific research in constructive sociology and human ecology. His Universal Encyclopedia, a sort of world brain, is a central idea which he believes would be capable of bringing about a world unity, only attainable through knowledge plus action. Readers of the SCIENCE NEWS LETTER, who followed Science Service's development of microfilm for intellectual utilizations, will be interested in Mr. Wells' conviction that microfilm will play an important part in the practical formation of the world brain.

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## Physiology—Psychology

PAVLOV AND HIS SCHOOL: THE THEORY OF CONDITIONED REFLEXES—Y. P. Frollov—*Oxford Univ. Press.*, 291 p., illus., \$4. Physiologists and medical scientists and students generally will be interested in this book about the great Russian physiologist and his work.

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## Archaeology

INDIANS OF THE RIO GRANDE VALLEY—Adolph F. Bandelier and Edgar L. Hewett—*Univ. of New Mexico Press*, 274 p., illus., \$3.50. The second in a series of handbooks of archaeological history prepared by Dr. Hewett. This one combines information regarding living Pueblos with documentary history by Bandelier, thus presenting these Indians and their unchanging pattern of life from two vantage points.

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## Medicine

ATLAS OF HEMATOLOGY—Edwin E. Osgood and Clarice M. Ashworth—*J. W. Stacey*, 255 p., illus., \$10. This is a book for practicing physicians, medical students and laboratory technicians. Besides the exceptionally fine illustrations, there is a text which takes up the application of blood studies and diagnosis, prognosis and treatment of disease.

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## Engineering

HEATING, VENTILATING, AIR CONDITIONING GUIDE, 1938—American Soc. of Heating and Ventilating Engineers, 1268

p., \$5. This is the sixteenth annual edition of this professional guide. It contains a technical data section, a manufacturers' catalog data section and the roll of membership of the American Society of Heating and Ventilating Engineers.

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## Dendrology

KNOWING YOUR TREES—G. H. Collingwood—*American Forestry Assn.*, 109 p., illus., \$1. Each species is described and pictured on a pair of facing pages. Illustrations show the entire tree (in deciduous trees, both bare and in foliage), closeups of bark, leaves, flowers, fruits, and other critical identification characters. Text gives non-technical description and brief statement of economic significance. An excellent book for either botanist or amateur.

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## Cytology

THE CHROMOSOMES—M. J. D. White—*Chemical Pub. Co. of N. Y.*, 128 p., illus., \$1.50. A compact treatise on chromosomes, designed particularly for students in biology who want their information up to date but lack time or need for the more bulky exhaustive works available. Naturally, a great deal has had to be left out, but the author shows good selective judgment and arranges his materials well.

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## Chemistry

MODERN METHODS OF REFINING LUBRICATING OILS—Vladimir A. Kalichevsky—*Reinhold*, 235 p., \$6. This volume is another in the series published by the American Chemical Society in which a particular field of industry is summarized in comprehensive fashion. Extensive bibliographies, footnotes and a long list of patents in the field of its subject matter makes this book valuable for the specialist in refining.

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## Anthropology

ORIGIN LEGEND OF THE NAVAHO ENEMY WAY: TEXT AND TRANSLATION—Father Berard Haile—*Yale Univ. Press*, 320 p., \$3.50. A great deal of information regarding Indian social life and religious thought is found in this long text of a single Navaho ceremonial, the war dance. The Indian who dictated the narrative was able to interpret the songs intelligently and to explain the rites.

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## History

THE CONQUEST OF CIVILIZATION, (New Ed.)—James Henry Breasted—*Harper*, 669 p., illus., \$4. Dr. Breasted's last book, and surely one of his best. It brings up to date the historic evidence that archaeologists have gleaned from studies of the past, and presents more vividly than ever the story of man's rise to civilization and his struggles for glory and power. It thus replaces the first edition, of 1926.

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## Ethnology—Biography

EXTRACTS OF LEWIS HENRY MORGAN'S EUROPEAN TRAVEL JOURNAL—Leslie A. White, ed.—*Rochester Historical Society*, 171 p., 75 c. It is an unusual experience, to visit Europe of 1870 through the eyes of so keen-minded an American. Prof. Morgan, sometimes called "father of American Anthropology," was chiefly attracted by ethnological features of European civilization. He wrote down many astute comments on the customs of Europeans, not all of which he approved.

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## Public Health

HEALTH SECTION REPORT, WORLD FEDERATION OF EDUCATION ASSOCIATIONS, Tokyo, 1937.—*Health Section Secretariat, New York City*, 242 p., \$1. Educators in general as well as health educators will find much of interest in this report of the proceedings of the seventh biennial conference. Efforts to improve child health are apparently world-wide. Methods and conditions to be remedied naturally vary widely, which makes the reports of the various delegates entertaining as well as instructive.

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## Radio

HOW TO PASS RADIO LICENSE EXAMINATIONS—Charles E. Drew—*Wiley*, 201 p., \$2. A brief volume in question and answer form giving the information and knowledge required to pass the government radio license examination. The author is instructor at the RCA Institute.

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## General Science

SCIENCE AND THE COMMUNITY—J. Ramsey Macdonald—*British Association for the Advancement of Science, London, England*, 13 p., 1s. A significant address by the former Prime Minister of England, which was his last public utterance of importance.

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